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VI

CENTENARY OF LORD LISTER
1827-1927

REMINISCENCES OF LISTER

and of his Work in the Wards of the Glasgow Royal Infirmary 1860-1869

By

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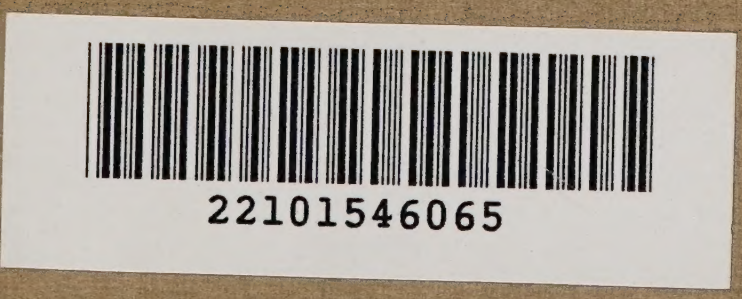

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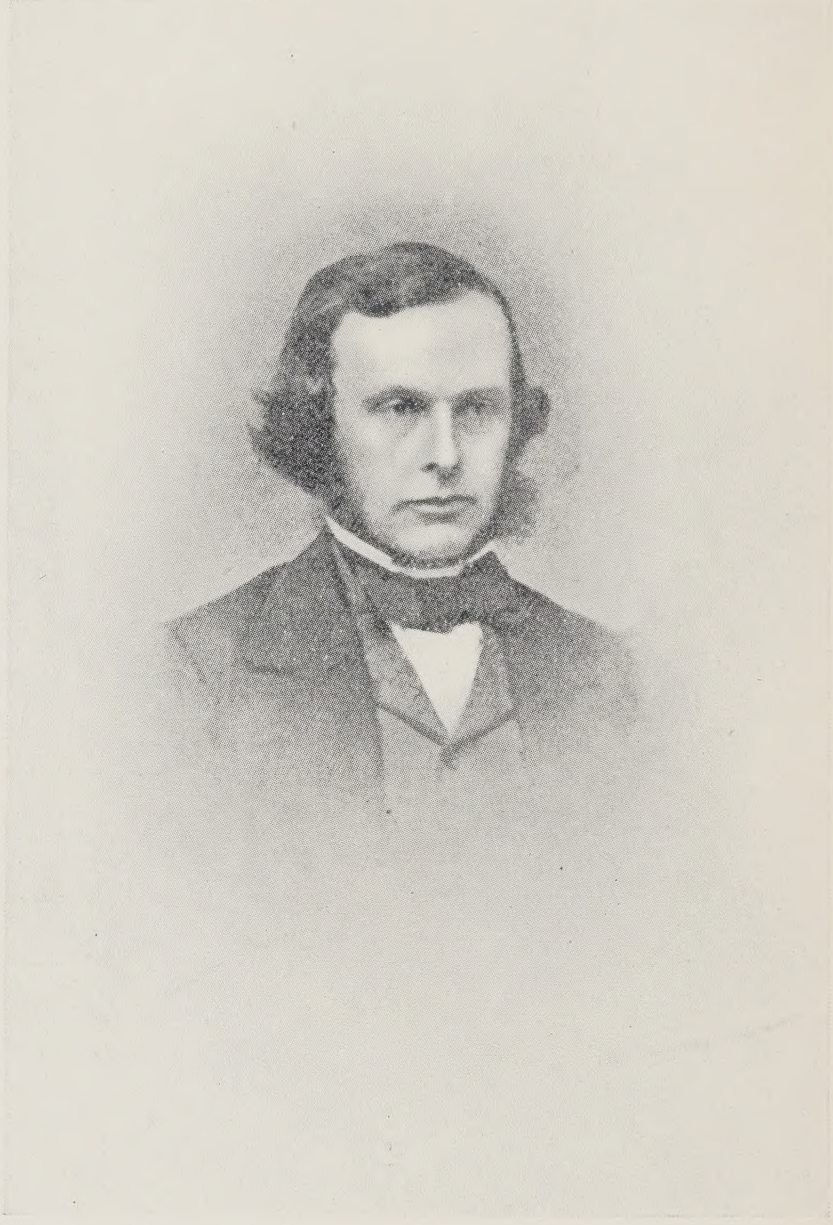

JOSEPH LISTER

Regius Professor of Surgery in the University of Glasgow (1860-69)

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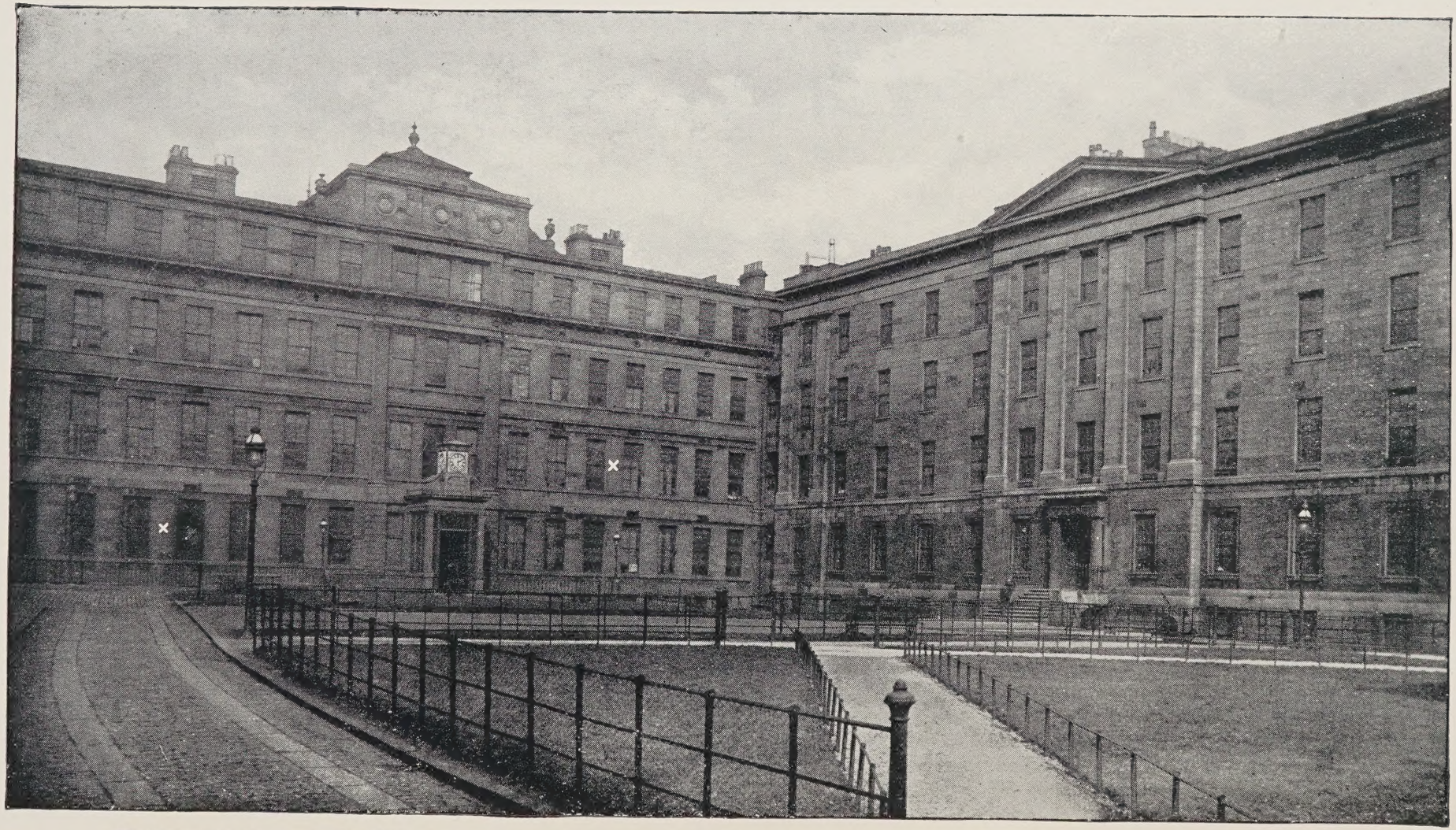
Preface

AS the Centenary of Lord LISTER's birth in April 1827 draws near, the number of those who 'from the beginning were eye-witnesses and ministers' of his beneficent revolution in Surgery becomes sadly smaller. Among the survivors none surpasses Sir HECTOR CLARE CAMERON, Emeritus Professor of Clinical Surgery in the University of Glasgow, in intimate personal knowledge of the facts, in loyalty to the Master's memory, or in competence to appraise the changes he effected in surgical methods. Sir HECTOR has from time to time made important contributions to the history of LISTER's life and work. But it was known to some that certain of his memories of LISTER's early years in Glasgow were still unrecorded in print, and at the request of his University colleagues he has kindly agreed to embody these in the following pages. The University is grateful for the opportunity thus provided of enriching its series of *Publications*, and of adding these *Reminiscences* to the world-wide Centenary Commemoration of its illustrious Regius Professor of Surgery.

DONALD MACALISTER,
Principal and Vice-Chancellor.

UNIVERSITY OF GLASGOW
March 1927



PHOTOGRAPH OF THE SURGICAL HOSPITAL AND THE FEVER HOSPITAL OF THE GLASGOW ROYAL INFIRMARY AS THEY WERE ABOUT 1890

The Surgical Hospital (left) is shown just as it was in Lister's day, except as regards the clock above the entrance and the connecting bridge between each flat of the two buildings, which were additions: the latter when the Municipality assumed the care of all cases of fever, and the Fever Hospital became the East Surgical House. White crosses mark Lister's Wards in the Surgical Hospital, Ward 24 on the ground floor and Ward 25 on the floor above. In his day the Court was an open one. The fencing, represented here, including that guarding the area in front of the Surgical Hospital, was added at a later date.

[Block lent by Mr. G. H. Edington]

Reminiscences of Lister

and of his Work in the Wards of the Glasgow Royal Infirmary (1860-1869)

IT was in the spring of 1860 that Joseph Lister became a teacher of Surgery in the University of Glasgow, having been appointed Professor of that subject by Queen Victoria on the nomination of Sir George Cornewall Lewis, Bart., the Home Secretary of the day, on 28th January 1860. He did not take up duty, however, until the Summer Session, when he conducted a course of Operative Surgery. It was not until the beginning of the Winter Session that he began in earnest his lectures on General Surgery, and took up his residence in a house he had purchased at 17 Woodside Place, where he lived until he left Glasgow. At that time it was a city of 390,000 inhabitants. It now numbers considerably more than 1,000,000.

To-day each Professor of Surgery in Glasgow University, and there are now two, is provided, on his appointment, with a set of hospital wards, and has full charge of the patients in those wards so long as he retains his chair. He is also required, by Ordinance, to teach both Systematic and Clinical Surgery, and to act as one of the Examiners in those subjects for the

Medical Degrees of the University. One of these Professors is attached to the Western Infirmary and the other to the Royal Infirmary. Exactly similar arrangements now exist in regard to the two Professorships of Medicine, and the two Professorships of Obstetrics.

It was quite otherwise in 1860, when Lister was appointed to the only Chair of Surgery which existed in the University. As regards clinical instruction of the students, he was in the same position as any other Surgeon in the City. When a vacancy occurred in the Royal Infirmary, the only general hospital then in Glasgow, he might apply for appointment if he so desired. If, after a canvass of the Directors, he was successful, the office was held for five years, renewable at the will of the Directors. At the conclusion of ten years of service, he must leave the hospital for at least a year ; then, on the occurrence of a new vacancy, he might again be elected for a further period of service, but only, if I remember aright, of five years' duration. This is now happily changed, the period of service of both Professors lasting until the arrival of the age limit of sixty-five.

There was a vacancy in the Infirmary wards in 1860. Lister applied for the appointment, at this time unsuccessfully,[1] but he was more fortunate in the following year, when again a vacancy occurred. He was then appointed to Wards 24 and 25, in what was still spoken

[1] In the course of the canvass of the Directors, which this application involved, Lister called upon Mr David Smith, the Chairman of the Board at that time. He conducted a large business as boot-and-shoe-maker, in the Trongate I believe, and was a remarkable man, of

of as the New Surgical Hospital, it having been opened in 1860. He was also placed in charge of a ward in the older part of the Infirmary, for the treatment of chronic male cases. He was thus always in charge of three large wards, like the rest of his surgical colleagues.

He was now in circumstances apparently very conducive to his entire comfort and happiness. He had passed out of the immediate control and guidance of those to whose opinions he was accustomed to defer. He was now promoted to a position of independence and daily responsibility in surgical work, which was to him very congenial and highly interesting. He had married a few years previously a lady, a daughter of Professor Syme, to whom he was greatly attached, and with whom he spent a happy life until death robbed him of her companionship in 1892. He had kind and able colleagues in the Senate, many of whom became

much natural ability and great public spirit. In the course of their conversation, Lister naturally said to him that having been recently appointed Professor of Surgery in the University of Glasgow, it would be of first importance to him to be also appointed to the vacancy in the Royal Infirmary. He would then have the opportunity of illustrating by his practice the theoretical opinions which he conveyed to the students by his lectures in the class-room of the University. "Stop, stop, Mr Lister," said Mr Smith, "that's a real Edinburgh idea. But our institution is a curative one. It is not an educational one." If the worthy old man could be permitted to revisit the glimpses of the moon, and ascertain the present state of surgery in all hospitals throughout the world, he would find that the curative results of treatment had advanced beyond anything that imagination could have conceived. This has been entirely due to the work and teaching begun in Glasgow, and continued afterwards in Edinburgh and London, of the young man to whom he was speaking.

intimate and life-long friends, and a class of students in Systematic Surgery which numbered 182.

At the end of his first Winter Session, so impressed and enthusiastic were the students, that they adopted the very unusual course of presenting him with an address, in which they spoke of their high appreciation of the lectures to which they had listened and the instruction that had been communicated to them. They ended up the address with an expression of "the hope, for the sake both of the rising profession and of the institution itself, that in the approaching appointment of a Surgeon to the Royal Infirmary, your application may meet with that success which your ability and position demand." The member of the class chosen by his fellows to read and present this address was J. B. Russell, afterwards the first whole-time Medical Officer of Health of Glasgow, a most able public servant of the City, and a pioneer of world-wide reputation in the nascent Science of Preventive Medicine. I well remember that when one evening, many years afterwards, Lister told me of these facts, he made use of words somewhat like these: "Depend upon it, when you find fellow-students think so well of a comrade as to insist upon thrusting him forward to perform what they consider a very important and representative task, you will find him, years afterwards, holding a high position in some branch of his profession. Watch his career and you will seldom be disappointed."

There was, however, one outstanding fact which grievously upset his equanimity and the happiness he felt after beginning as a Surgeon to the Royal Infirmary. Those engaged in the study and practice of surgery,

in this, the centenary year of Lister's birth, are hardly able to apprehend with any approach to reality what the state of surgery, and especially of hospital surgery, was, when he began to practise it in Glasgow. Then the ultimate fate of every man who had his body wounded, whether by accident or by surgical operation, was a matter of absolute uncertainty; and the diseases which were apt to attack such patients, especially in hospital, and generally led to a fatal issue, were of very frequent occurrence, varied in character and sudden in onset, often occurring when all seemed most hopeful and satisfactory. This was, more or less, the existing condition in all hospitals, but the New Surgical Hospital of Glasgow soon proved itself one of the most unhealthy and insanitary. In almost every wound except some of the smallest, suppuration occurred, and indeed was always expected. Even in those who made satisfactory recoveries, convalescence was apt to be slow, and associated with frequent more or less painful interruptions. In a large proportion of cases worse things happened. Secondary hæmorrhage, septic-æmia and pyæmia, hospital gangrene, tetanus, and erysipelas—in fact all those fatal complications commonly then spoken of as hospital diseases—were never entirely absent from the wards. Such diseases as pyæmia and hospital gangrene were often epidemic, and I myself, when a student, have seen as many as five men die from pyæmia following amputation of a limb for injury, in the male accident ward, in one week; while others lay ill in the same ward with pyæmia and hospital gangrene. The least reflective can easily realise how much grief and disappointment was caused

by such occurrences to a man like Lister. More than once, as he entered his carriage at the gate, after visiting the wards, I have seen him deeply distressed and agitated.

Before coming to Glasgow he had already earnestly studied the determining causes of inflammation and suppuration in wounds, and was well persuaded in his own mind that their prime cause was the decomposition of the blood and serum, brought about through the influence of the atmosphere. He insisted on scrupulous cleanliness and in the frequent hand-washing of all who made or dressed wounds. By way of prophylactic treatment solutions of potassium or sodium sulphite were administered, as Polli of Milan had recommended, in frequent doses each day, to every patient admitted with a compound fracture or other severe lacerated wound. It was such patients chiefly, together with those on whom amputations were performed, whether primarily or secondarily with a view to saving their lives, that were attacked by these hospital diseases; they constituted the great bulk of anxious surgical practice at that date, for it must be understood that the range of surgery was comparatively limited. There was no abdominal, cranial, or thoracic surgery, if we except the occasional evacuation of pus from the thorax by means of cannula and trocar. The free opening of these body-cavities was not practised till long afterwards. Such procedures were rendered possible by the researches and practice of Lister, but he himself never performed these operations while in Glasgow; they were still developments of the future.

What gave his work at this time its real impetus in the right direction was the fact of his attention having been turned to the recent writings of Pasteur, who had proved by beautiful and ingenious experiments that putrefactive and fermentative changes in organic liquids were due to the action of infinitesimal organisms derived from the atmosphere, and not, as Liebig had taught, to the action of the oxygen it contained. These organisms owed their energy to their vitality, and Lister saw at once that if they could be destroyed before entering the wound, the whole problem would be solved.

For this purpose the agent he adopted was carbolic acid, and most naturally it was in compound fracture that he first made use of it. The results were most astonishing, many of the injuries following the same tranquil course as if the skin had remained unbroken. The method adopted was as follows. A small piece of calico saturated with the undiluted acid and held in dressing forceps was introduced into the wound, and all its interstices were stirred up as far as could be reached without undue force. Two layers of lint saturated with the undiluted acid were laid over the wound. They were made large enough to overlap it in all directions for about half an inch. Over these was placed a thin piece of block tin moulded to the shape of a youth's straw hat, the hollow portion or crown fitting over the pieces of lint, while the flattened edge or brim lay close to the skin and could be fixed to it by strips of plaster. The carbolic acid made a thick paste with the blood, both in the wound and in the substance of the little mass of lint which adhered

to its surface, and formed a sort of antiseptic crust or scab. The limb was then fixed with suitable apparatus, well padded with some soft and absorbent material to receive the serum that oozed from under the crust. Once a day or so the tin cap was removed and the crust of lint and blood was lightly painted over with carbolic acid on its external surface. The object aimed at was to keep this crust from becoming septic while its surface next the wound gradually lost the carbolic acid it originally contained and so became comparatively unirritating. The procedure was in fact an imitation of those fortunate cases of compound fracture in which a small wound becomes at once covered and sealed by a clot of blood, which dries into a scab. The communication with the outside having been cut off, it often happened that healing and cicatrisation took place without inflammation and suppuration, exactly as in a simple fracture.

The vapour of the carbolic acid which was daily applied to the surface of the antiseptic crust interfered with the cicatrisation of the wound, and so the crust had to be torn off from the wound to which it often adhered very firmly, as soon as it was thought that the communication with the interior was well shut off. Some simple form of dressing was then applied, which permitted of cicatrisation proceeding to a conclusion.

I have described at some length this first and very crude method of treating compound fracture, because it is an illustration of the fact, that, from first to last, whatever means he used to carry out his treatment, Lister always aimed at the ideal of converting open wounds to the condition of those still protected by

unbroken skin. He felt himself justified now in communicating a paper on the subject to the meeting of the British Medical Association in Dublin in 1867.

This form of treatment was next applied to chronic abscess connected with diseased bone, instances of which were very serious in their final issue, when opened or allowed to burst, and treated with poultice or water-dressing. One day, delighted as he was with the results obtained in compound fracture, he determined to apply the same principle to these large abscesses. A case having presented itself, after opening it with the usual precautions, he mixed some of its thick contents with liquid carbolic acid and laid this mixture over the wound within two pieces of lint covered with a cap of block tin. When the case was dressed next day only thin serous fluid exuded. No material was furnished therefore for a second dressing of the same character, and so he used instead a putty, made by mixing ordinary whiting (carbonate of lime) with a solution of carbolic acid in boiled linseed oil. This was spread upon a piece of block tin and laid over the incision, widely overlapping it in all directions. It was fixed by strips of adhesive plaster, and over all was bandaged an absorbent compress. This case remained free from any septic change throughout, and ultimately healed, having furnished nothing from first to last but a steadily diminishing quantity of clear serous fluid.

The putty was now used in the treatment alike of compound fracture and of abscess. In compound fracture, after the wound had been thoroughly and completely syringed out with a 5 per cent. solution of carbolic acid, a piece of lint saturated with carbolic oil

(1 to 4) was placed over it, large enough to overlap it in every direction. Over this was placed a large dressing of the putty smoothly spread on calico to the thickness of a quarter of an inch, and covered with block tin. The dressing of carbolised putty was changed daily, but the piece of oiled lint, soon saturated with blood, was left next the wound, harbouring under it a crust of blood of greater or less amount. It usually became fairly dry, and when the time arrived for discontinuing the splints and dressing, either a firm scar or a superficial sore was exposed to view.

The block tin as covering was afterwards dispensed with, and dressing with putty was extended to the treatment of incised wounds. It was, however, clearly necessary to get rid of the old method of using the ligature. Up till now the small vessels which bled in the wound were dealt with by torsion, while those which were too large to be so staunched were ligatured with silk ligatures, the ends of which were left hanging outside the wound, which was closed with interrupted sutures of silver wire, as recommended by Marion Sims. Each ligature so applied held in its grasp a small portion of tissue, which ultimately separated as every slough did. But Lister had by this time observed, in the treatment of compound fracture, that sloughs and pieces of necrosed bone, in fractures with large open wounds, instead of separating when the wound was treated antiseptically with success, became absorbed and no longer irritated or acted as foreign bodies among the surrounding tissues. To use his own words, " A foreign body, introduced among the tissues, does not exert any disturbing influence upon them, unless it be

either mechanically or chemically irritating. Thus, it is well known that a needle or a spiculum of glass may lie for an indefinite period, embedded in the living tissues, and any irritation which may result is due simply to the rigidity and form of the foreign solid. Now, a bit of silk or linen thread being composed of material of soft substance, and as unstimulating chemically as glass or steel, its presence among the tissues cannot of itself determine any disturbance. But unlike the glass or metal, the thread is porous and contains in its interstices putrefactive germs, which, developing in the serum that bathes the ligature, give rise to the acrid products of decomposition, and these in their turn stimulate the surrounding tissues to granulation and suppuration. If, however, the thread was steeped in some liquid calculated to destroy the life of the germs in its interstices, and the wound was dressed antiseptically, the ends of the ligatures being cut short, they might be left with confidence that their presence would not interfere with primary union, or occasion any disorder in surrounding parts. Before applying these principles upon the human subject, I thought it right to test them on one of the lower animals."

He, therefore, on the 12th December 1867, tied the left carotid artery of a horse in the old Veterinary College in the Parliamentary Road, Glasgow, with a piece of purse silk steeped in a saturated solution of carbolic acid, the ends being cut short and the wound dressed antiseptically. I was present and gave such assistance as was necessary. Healing occurred immediately. Six weeks afterwards the horse was dis-

covered one morning to be dead, having died apparently in its sleep, in the loose box. Lister was confined to bed at the time with a severe cold, but in response to a message from him I at once went to his bedroom and interviewed him. Provided with a quantity of old towels and some waterproof material, I drove to the Veterinary College, and according to his instructions cut out the whole of the tissues on the left side of the neck down to the vertebræ, and having wrapped the mass in the towels and waterproof, drove with it at once to his house. It was now about 11 p.m., but in spite of that fact, he put on some clothing and came downstairs. I could not dissuade him from proceeding at once to do a certain amount of dissection, which kept him occupied until so far as I recollect about 2 a.m. He satisfied himself that healing had been in every respect complete and immediate. By this dissection and further careful examination later, the parts shewed conditions which are best described in his own words. " On laying open the vessel I found on the cardiac side of the ligature a firm adherent clot an inch and a quarter long, but at the distal side, coagulation had been entirely prevented by the reflux current of blood, through a branch about as large as the human vertebral, which took origin as close to the ligature as possible. Under such circumstances secondary hæmorrhage would necessarily have occurred had a thread been applied in the usual way. Here, however, the artery appeared as strong at the part tied as elsewhere. The *cul de sac* shewed indeed some irregularity in consequence of the puckering of the internal and the middle coats, but the surface appeared

completely cicatrised, and presented the same character as the natural lining membrane of the vessel, and the ligature which seemed as yet unaltered was found lying dry in a bed of firm tissue, that within the noose being apparently a new formation, in place of the portion of external coat killed by the tightly tied thread, while externally the constriction necessarily caused in the first instance by the operation had been filled in by a similar compact structure."

Very shortly afterwards he was asked by the late Dr Andrew Fergus of this city to see an elderly lady suffering from an aneurysm of the common femoral artery. A few days afterwards he tied her external iliac artery, using a silk ligature steeped in undiluted carbolic acid. It was tied with sufficient force to divide the internal and middle coats of the artery, the ends were cut short, and the wound dressed antiseptically. The aneurysm consolidated and the wound healed by first intention. In four weeks the patient was allowed to leave her bed, and in another fortnight was able to go out in the open air for a little. Within a year, after repeated attacks of spasmodic dyspnœa, she died suddenly from the rupture of an aortic aneurysm. Careful examination after death of the artery operated upon shook Lister's confidence in this form of ligature. The knot of silk was still in great part present, enclosed in a thin-walled capsule. There were evidences of the silk having been eroded by the action of the tissues around it, pieces of its fibres being present in what looked like a drop of puriform fluid, not having lost their elasticity and not having been materially softened, but only now "superficially nibbled," so to speak—

"indeed," Lister wrote, "considering the organic character of silk, the remarkable fact seems to be, not that it should be absorbed by the living tissues, but that it should have resisted their influence so long."

The use of animal ligatures was next resorted to. Although ligatures of catgut, leather, and tendon had long been tried and abandoned, it was hoped that different results might be obtained from their use in the absence of sepsis. Lister had long been satisfied that the injection of a strong solution of perchloride of iron or tannic acid, for the cure of nævi, produces sloughs and clots, which though impregnated with those chemical substances, disappear without suppuration. He had no fear therefore in using carbolic acid in the purification of the animal ligatures, for he had already observed that not only portions of dead tissue and of blood clot, free from sepsis, were absorbed, but also that this process was not interfered with when carbolic acid had freely acted upon them.

On 31st December 1868, when on holiday at his father's house near London, he tied the right carotid artery of a calf, about the middle of the neck, with ligatures of two kinds, separated from one another by a distance of about an inch and a half. One was composed of three strips of peritoneum from the small intestine of an ox, twisted into a cord, the other being fine catgut. Both had previously been soaked for four hours in a saturated watery solution of carbolic acid. The wound healed by first intention, and the calf was killed a month afterwards. He found on dissection, and at first to his great disappointment, that the ligatures were to all appearance still present and as

large as ever ; but more careful inspection shewed that in reality they had been absorbed and replaced by bands of living tissue, the growing elements of which had " replaced the material absorbed, so as to constitute a living solid of the same form." Further, " they had indeed a deceptive resemblance to their former condition from the persistence of the substance of the impurities of the original materials, the darker adventitious particles being of a mineral nature incapable of absorption, so that they had remained as a sort of tattooing of the new structure. The fleshy bands so formed were found continuous with the arterial walls, and so far from weakening the vessel at the point of ligature rather strengthened and reinforced it; while, by the early healing of the wound, an immediate reconsolidation of the tissues detached from the vessel had taken place. The evidence of the organisation of the ligatures, though clear to the naked eye, was abundantly confirmed by the microscope. All these facts seemed to give sure promise, as indeed proved to be the case, of security against the secondary hæmorrhage so frequent and so justly dreaded up to that time, as well as of the absence of suppuration in connexion with such ligatures."

Since that time, the catgut ligature prepared in one way or another has been employed almost universally in tying arteries whether in their continuity or after being divided in wounds, and it has now become an article of commerce.

Although the antiseptic putty had yielded striking results, it has various inconveniences, and Lister expended an enormous amount of time and patience in

the attempt to find a reliable substitute. At length he discovered in shell-lac that which he was in search of. When carbolic acid was mixed with it, it formed a flexible material which retained the acid with great tenacity, and from this reliable reservoir the acid was given off constantly but not too quickly. Spread as a plaster it stuck however too firmly to the skin, obstructing all drainage. From previous experience in his experiments, he had learned that carbolic acid passed very freely through india-rubber and gutta-percha, and this fact enabled him to get over the difficulty of the adhesiveness of the new plaster. A mixture of one part of carbolic acid in four parts of shell-lac was spread in thin layers on calico and painted over with a solution of india-rubber in benzine. When the benzine evaporated, a thin layer of india-rubber was left, but this in no way interfered with the action of the antiseptic.

This plaster could not be disintegrated by friction, like the putty, and being much lighter, was not only far less cumbrous, but could be more easily maintained in position; while being always ready for use, it avoided the great inconvenience the putty had of requiring to be specially prepared by the surgeon. Hence, its use was resorted to alike in the treatment of injuries, abscesses, and incised wounds.

Lister always fully realised the necessity of limiting as far as possible the irritating effects of the chemical substances employed in the treatment. His ideal was to place wounds as nearly as possible in conditions resembling those of subcutaneous injuries. To avoid therefore, as much as he could, the actual contact of

the antiseptic with the surface of the open wound, or with the healing line of an incised one, and so to protect them from its chemical irritation, he adopted the use of what he called for distinction's sake "the protective plaster."

The vapour of carbolic acid freely passed through gutta-percha or thin sheets of india-rubber, but did not pass through oiled silk. He therefore made this the basis of the plaster to be used. He covered it with gum copal, which is even more antagonistic to the passage of carbolic acid than oiled silk itself. Lastly he painted it over with a solution of dextrine. Before being applied to the wound, it was dipped in a solution of carbolic acid, the dextrine-coated surface ensuring that it was uniformly wetted. The acid was soon dissipated, and the plaster became a complete protection from the direct action of the superimposed and widely overlapping antiseptic dressing, while it in no way interrupted the outflow of blood and serum.

It will be observed that up to this time, the dressings were made of unabsorbent materials, impervious to the discharges, and this was the character of all the dressings used by Lister in Glasgow. It was not until he had gone to Edinburgh that he ventured upon the use of porous dressings, when the next advance, that of the carbolic acid gauze, was made; and I have now described as accurately as I can the means he used when he was in charge of Surgical Wards in the Glasgow Royal Infirmary.

I may here digress so far as to relate a tragic occurrence which took place about this time, as it seems to me to have an interesting bearing on the surgery of the

day. I had been assisting Lister one winter afternoon in private practice with some surgical duty, and on its conclusion we drove in his brougham to the Infirmary, I forget for what purpose. We were however both busy in Ward 24 when suddenly we heard a scream of alarm outside, the galloping of horses, and immediately afterwards the terrible crash of horses, brougham, and coachman into the deep area which ran along the whole front of the Surgical Hospital. Lister rushed out immediately. It was a cold dark night, and from the stone bridge which spanned the area at the entrance of the main door of the Hospital, I saw the carriage lying on its side with the horses still attached to it; they were kicking violently against the stone wall and every blow with their hoofs emitted showers of sparks in the darkness. They also uttered a constantly-repeated whinnying cry of alarm, which mingled with pitiful groans from the coachman who was partially pinned under the carriage. Lister running down the grass slope had leapt into the area, when he found the kicking horses between him and the coachman. After most violent kicking they desisted for a minute or two from complete exhaustion. Lister seized the opportunity of jumping over their legs and reaching the coachman. In not more than another minute or two several hospital porters and others, whom I joined, got into the area on the other side of the entrance bridge to the hospital, and we raised the brougham a little, so as to enable Lister with some assistance to free the coachman. The injured man was then carried through a door which opened from the basement into the area and was taken upstairs into Ward 24. It was found

that he had sustained a simple fracture of one humerus, but what he most complained of was severe pain in the abdomen; he also exhibited the appearance of very severe shock. Everything which seemed to be required was done for him and he was put to bed in the ward. As we afterwards drove home, Lister expressed to me the fear that the coachman had probably sustained a rupture of some part of his intestinal tract. On visiting him the next morning, it was found that he had vomited several times in the night, and that his abdomen was beginning to shew signs of distension. He died after some days, of peritonitis, and an examination of his abdomen was made. There was a slight rupture at one part of the small intestine thoroughly plugged by a prolapse of the mucous membrane. It had evidently caused such extravasation of the contents of the intestine as led to an extensive septic peritonitis and death.

Lister made a correct diagnosis of the injury, but followed the course of treatment which was, at that time, the universal practice, when it was considered almost criminal to open the peritoneum intentionally. Nowadays any competent surgeon would in similar circumstances not only diagnose correctly such a case but would forthwith operate, cleansing the peritoneum and stitching up the rupture. He would almost certainly save the patient's life.

This is an illustration of the great progress now made possible by Lister's teaching and practice, although at this stage he did not dare to venture so far into forbidden territory. I forget what degree of progress had been then reached in the antiseptic system of treat-

ment, but I know that the occurrence took place in the days of its comparatively early development.

The cause of the accident was that, the evening being a very cold one, the coachman kept the horses moving backwards and forwards, and when turning them at the gate on one occasion the pole suddenly snapped and they bolted. The coachman no longer having any control of them, they dashed headlong into the area. He was prevented from leaping off before they went over the grass slope into the area by the fact that a heavy rug was buckled to the carriage across his knees, and in his great fright he failed to free himself. It was then that he uttered that terrible scream which first alarmed us.

To return from this digression, I have already stated that from various causes, Lister's Wards, although just recently built, proved not only unhealthy but were hot-beds of pyæmia, erysipelas, and hospital gangrene, and these diseases affected most severely those wards nearest the ground. Ward 24, his male accident ward, was on the ground floor. About this time a great mortality from these diseases occurred in Ward 23, the other accident ward on the ground floor, under the charge of a colleague and separated from Ward 24 by a passage only twelve feet broad. The mortality became so great as to lead to the temporary closing of the ward and to the investigation of the cause of the mischief, which was believed to be a foul drain. An excavation disclosed, however, what seemed to be the real cause. A few inches below the surface of the ground behind, on the level of the floors of the two accident wards, there was found a multitude of coffins

which contained the bodies of those who had died in the cholera epidemic of 1849. They were so little changed that their clothes at the time of their hurried burial were easily distinguishable. Yet at the time that this discovery was made Lister was able to state, to the British Medical Association in Dublin, that during the previous nine months, during which the antiseptic treatment was carried out completely in his wards, not a case of pyæmia, erysipelas, or hospital gangrene had occurred in them. This corrupting mass " was fully treated with carbolic acid and quick-lime and an additional thickness of earth was laid over it, and further a high wall at right angles at the end of the building, and reaching up to the level of the first floor, so as necessarily to confine the bad air most prejudicially, was pulled down and an open iron railing was substituted for it."

Other causes of a very similar character in the surroundings of the hospital no doubt contributed to its unhealthy character.

In 1870, after he had gone to Edinburgh, Lister published a well-known paper, most of which was I believe written while he was still in Glasgow, entitled, " On the Effects of the Antiseptic System of Treatment upon the Salubrity of a Surgical Hospital." He was able to say that the effects of that treatment " upon the wards lately under my care in the Glasgow Royal Infirmary were in the highest degree beneficial, converting them from some of the most unhealthy in the Kingdom into models of healthiness."

The publication of this paper was soon followed by a letter from the Secretary of the Royal Infirmary con-

taining a good deal of what I may call angry criticism, and concluding with the following words: "In their (*i.e.* the Directors') opinion, which is shared by their number belonging to the medical profession, the improved health and satisfactory condition of the hospital, which has been as marked in the medical as in the surgical department, is mainly attributable to the better ventilation, the improved dietary, and the excellent nursing to which the Directors have given so much attention of late years."

This letter was published both in the *Lancet* and in the *Glasgow Herald*. Lister felt that he must make a reply and make it in the same journals. In his reply, very courteously and politely expressed, he fully substantiated all that he had published in his paper, and there the matter rested. There was no rejoinder. Lister has put it upon record that although his methods underwent in the future great and important improvements, by the time he left Glasgow, he was able, with confidence, to ensure that a wound under his care pursued from first to last an aseptic course. If it had been otherwise, he said, many of the operations he then performed would have been quite unjustifiable.

I may here describe very shortly one or two of such operations which I witnessed, and of which I have a distinct recollection.

A young man who had sustained a very severe injury to one ankle four months previously, was admitted to Ward 24. The fibula was fractured about two inches above the joint, and the internal malleolus was broken off at its base, driving the bones of the leg forwards and inwards and so producing dislocation of the foot

backwards and outwards. The heel was very prominent and the foot greatly everted, and as the fractures were firmly united by bone the limb was quite useless. In order to correct, if possible, this serious displacement, Lister made a curved incision behind and below the prominent end of the tibia, and having detached the soft parts from the bone, he divided the callus with bone pliers, a solution of carbolic acid in four parts of olive oil being dropped into the wound during the procedure. Covering up that wound, he then divided the fracture of the fibula. I need hardly add that before all this was done, the whole region operated on, the hands of the operator and his assistants, as well as the instruments, were thoroughly cleansed and immersed in a watery solution of carbolic acid. Of course in the division of the mal-union of the tibia, the ankle joint was opened. The wounds were now covered up with a temporary antiseptic dressing, and with the use of pulleys acting upon the outer and posterior part of the foot through the medium of a skein of worsted soaked in the antiseptic, while a padded belt supported the opposite aspect of the leg above the ankle, the dislocation was successfully reduced. Such dressings as were then in use were applied. After a subsequent division, subcutaneously, of the Tendo Achillis and the plantar fascia, the patient was able, after the lapse of some months, to walk firmly and well, complaining only of some remaining stiffness of the ankle.

Another operation, only justifiable from the confidence felt in being able to make and maintain the wound in an aseptic condition, was performed in the case of a strong man, forty-five years of age, who had

fallen from a cart and broken the neck of one femur eighteen months previously. He was at the time admitted to a hospital, in Ireland, where the accident happened, but was dismissed in five weeks on crutches.

There was evidently an extra-capsular fracture of the neck of the bone with $1\frac{1}{8}$ inch of shortening; he could lay no weight on the limb, and was still using crutches. Under chloroform, by very free movements of the limb, Lister forcibly broke down the adhesions, some of which gave way with a report heard all over the operating theatre. The pulleys were then applied and the lower fragments pulled down as far as possible. With the pulleys still active, he was turned on his sound side, and a very free longitudinal incision made, from above the trochanter downwards and to a depth which admitted of the tip of the finger being introduced between the fragments. Lister then roughened the end of each fragment with a powerful gouge. He left an abundance of bone chips in the depth of the wound, well knowing that, if all went well, nature would deal with them satisfactorily. A large dressing of the lac plaster was applied externally. The operation from first to last was conducted with such antiseptic precautions as were then strictly in use. While the pulleys were still acting, a long splint was put on firmly, iron bars being substituted for the wood opposite the wound to admit of access for dressing. A subsequent reactionary hæmorrhage occurred, and was dealt with by plugging with strips of lint dipped in carbolic oil solution. This patient was a brother of one of the nurses in the ward, and when heard of, some-

time after returning home to Ireland, was walking about with a useful limb and with only $\frac{3}{8}$ inch of shortening.

Another operation of a different character, and equally dangerous if sepsis occurred, was undertaken by Lister, not very long before he left Glasgow. The case was related by him in his address at the Plymouth meeting of the British Medical Association on 10th August 1871. The patient was a young woman with a large ventral hernia, which protruded through a somewhat large scar, "originating apparently in a deep-seated abscess in the abdominal wall." It caused her great inconvenience, and could not be fully reduced by taxis. With the usual antiseptic precautions, he freely opened the sac, exposing a mass of intestines and omentum with extensive adhesions to one another. When these adhesions had all been detached, partly by tearing and partly by the knife, the viscera were reduced, and the orifice, three inches in length, by which the sac communicated with the abdominal cavity, was freely exposed. He then pared its edges, cutting off the peritoneum from the muscular and fibrous structures and stitching the edges with closely-applied interrupted sutures of prepared catgut. The ends were cut short. The patient made an uninterrupted recovery, and left the hospital without any hernia. A very small protrusion did afterwards appear at one part of the cicatrix, but it was readily reducible and was treated satisfactorily by a truss. So far as my memory serves me, this was the only case in which Lister opened the peritoneum during his hospital service in Glasgow.

In 1867 Lister performed an operation for removal

of Carcinoma of the Breast. The patient was a relative to whom he was much attached, and although not a hospital case, I mention it here, because it is a good instance of how his confidence in antiseptic treatment led him in advance of others. In this centenary year, surgeons all over the world perform extensive operations for cancer of the breast, and, if it is taken early, we know that many cases are thereby permanently relieved ; but in 1867 surgeons still considered that the danger of septic infection was so great, when the armpit was opened and cleared out, as to make any such operation unjustifiable. Mr Paget and Mr Syme had both declined to interfere in the case of this patient, and she was about to consult a plaster-curing quack. But Lister, having just rehearsed the procedure on the dead body, performed the operation in his own house, removing both breast and glands. Three of us who assisted him saw how much it cost him to undertake so bold a procedure for the first time on one so dear to him, but he felt that he was not justified in entrusting it to another. He divided both pectoral muscles and cleared out the armpit as thoroughly as is done to-day in the routine procedure in such cases. The lady lived, I think, for three years at least, but then died from a tumour of the liver. No local recurrence whatever took place.

From these four cases, at all of which I was present (and I could add considerably to their number), it will be recognised how far he was in advance of others at this period, and how he pointed the way in which great progress might be made in the future, in more than one direction. In doing this, however, he was

THE STATUE OF LISTER

in Kelvingrove Park, Glasgow : unveiled in September 1924

constantly haunted by the dread that others might follow him prematurely, believing that what they must trust to for success was the use of carbolic acid in lotion and dressing, and not necessarily possessing a complete belief in what was then spoken of as "the germ theory." They continued to regard the treatment as a kind of dressing rather than as a new system founded on a central scientific fact. This doctrine, of the germ origin of sepsis, many of his supposed imitators scornfully denied, and kept on the treatment of all wounds by free application of the lotion with syringe and dressing kettle. They called his system of treatment "the carbolic treatment," much to his annoyance, and I have often heard him remark, "I use less carbolic acid, I believe, than most of those who suppose they are applying antiseptic treatment in close imitation of me."

I may here recall a form of operation for excision of the wrist joint, which was devised and performed by Lister in the very early sixties. It was mainly resorted to in cases of tuberculous diseases of that joint, and was practised in many instances at a period so early in point of time as not to have the advantage of treatment by the antiseptic system in anything like a reliable form. For the most part also, the cases which presented themselves for treatment were the seat of several openings discharging freely, and anyone who reads Lister's account of these cases (The *Collected Papers*, Vol. II. p. 417) will notice that many, even of those that ultimately resulted in very useful hands, are said to have been attacked in the course of treatment, some of them more than once, by hospital gangrene. The operation has been, so far as I have opportunity of

hearing, now almost entirely discontinued. This may be due to the success of treatment at an earlier stage by long-continued fixation and rest, and by the exposure to the light of the sun or of some more or less efficient substitute, under competent medical advice and guidance, combined with the use of the sharp spoon when deemed necessary. Methods of this kind in young subjects seem to render the excision of joints little practised, because really little required, compared with what was the case fifty or sixty years ago. This particular excision also, I admit, was one which required all the patience of a Lister. I have seen it occupy two hours for completion in his hands, and the convalescence of the patient lasted for about a year.

I gave the *Oration* on Lord Lister on Commemoration Day in the Bute Hall (23rd June 1914), on the invitation of the University Court. A day or two afterwards I received a letter from an old woman who had been a patient in the Glasgow Royal Infirmary when I was House-Surgeon. She had seen the advertisement of the meeting on Commemoration Day, and had managed to come there and gain admittance. She wrote as follows : " I was in the Bute Hall on the 23rd and heard you on the late Lord Lister. It was a great joy to me to hear of the good works of Lord Lister from one who knew him so well, and I am now sure that you are the Dr Cameron that I knew. I was a patient under Lord Lister in Ward 25. It was my wrist. Perhaps you will remember that I had hospital gangrene three times and had two operations. It has been a useful arm to me. I was then a girl of twelve years, and did not understand the good that was being

done to me, and to the whole world, forty-nine years ago ; but I am thankful to say I have realised it years ago, and was proud to hear of his good work being known. I trust, Sir, you will forgive me writing you. I tried not to intrude, but could not help myself."

Ten years afterwards, in 1924, I was honoured by being asked to unveil the statue of Lord Lister in Kelvingrove Park in this city. The same old lady again came there, and when the ceremony was completed, modestly requested to be allowed to place a wreath that she had brought at the foot of the statue. It was a touching sight, and shewed that a good deed is capable of living on in the heart of an obscure and humble woman and maintaining a beautiful gratitude to the end of a long life. I lately addressed to her a letter asking some questions about her hand, and received a reply from her grand-daughter telling me that she had died in April 1925 from a cerebral hæmorrhage, aged seventy-two.

While a surgeon to the Glasgow Royal Infirmary, Lister had numerous visitors from other hospitals, both at home and abroad; but I shall mention only one or two of them. The first two I shall refer to each stayed in Glasgow for some time, during which they were in daily attendance on his practice and were exemplary students of all the details of the system so far as it was then developed. They were Professor Saxtorph of the Frederics Hospital, Copenhagen, and M. Lucas-Championnière, at that date still a very young man, but ultimately a surgeon of the Hôtel Dieu of Paris. They were also students of his practice both in Edinburgh and London, and throughout their lives prac-

titioners and teachers of antiseptic treatment—indeed Lister always regarded Saxtorph as having been the first to introduce the system to the Continent. I had the honour of being elected one of a Committee of five who, on the occasion of his eightieth birthday, prepared the volumes of his collected works as a permanent memorial of so happy an occasion and of a life " so rich in benefits to mankind." We had much trouble in arriving at the proper form of the title page, and I had a good deal of correspondence with Lister regarding it. In a letter dated 7th May 1908, he wrote to me as follows:

" With respect to the title page of the book, I have been thinking for some time that it would be better to revert in the main to the proposals of the Committee . . . ' Joseph, Baron Lister,' originally proposed by the Committee, has the advantage of expressing my true position in the Peerage, which ' Lord Lister ' does not; then follow selected distinctions. Those which are English naturally come first. Of the foreign ones I have given first Knight Grand Cross of the Danish Order of the Dannebrog, partly because it is a highly distinguished title, and partly because Denmark was the first country on the Continent to employ the antiseptic system in hospitals. . . . All this seems terribly egotistical, but I know you will excuse me, and it seemed unavoidable."

Here it will be observed he states distinctly what he believed was the great service rendered by Saxtorph through his early and successful adoption of the antiseptic treatment, and his introduction of it to the Continent.

He was equally sensible of the good service that Lucas-Championnière did by his constant advocacy of the treatment in France. This service, it may be said, lasted from the date of his visit to Glasgow in the sixties, until October 1913, when he suddenly died one afternoon while reading a paper before a Committee of the Institute of France.

Among many other visitors to Lister's wards in Glasgow whom I particularly remember, was Dr Collins Warren, of Boston, then a very young man, who still survives, although, like myself, he is now well advanced beyond the fourscore-year mark. In a letter I received from him two years ago, he writes as follows regarding that visit:

"I have always looked upon the circumstances surrounding my visit to Lister, in 1869, as of peculiar interest. After studying medicine and surgery of that period at the great sources for three years, I was confronted with a new doctrine which necessitated a complete revision of Medical Science. It was, as it were, like suddenly stepping out through a door from an old era into a new one ; but the change came slowly. . . . The old generation meanwhile has passed away, and a new one imbued with a new doctrine has come to take its place."

It was the old story, new and revolutionary doctrine, although true and immensely important, was not at once eagerly embraced by all. The older men had practised and taught all their lives a certain orthodox surgery which they were unwilling to exchange for a totally different system at the bidding of one man and he comparatively a youth. "One man knew a secret

way into the city," says a Spanish proverb, " but the besiegers said, why should we, who are many, follow one man ? " It is little wonder, therefore, that when Lister went to occupy the Edinburgh chair, young men were warned against attending his clinique or having anything to do with his unorthodox teaching. But he had every confidence in youth. " I have always had youth on my side," he used to say with much joy and satisfaction, when discouraged by the cold criticisms of colleagues and other contemporary practitioners. History has proved how fully justified his confidence in youth was. The whole civilized world is now a convert to his views, and is anxious to celebrate with becoming enthusiasm the occasion of the centenary of his birth.

The period of Lister's service in the Chair of Surgery, in the University and Royal Infirmary of Glasgow, was on the whole one of great lustre and happiness, and in a letter addressed to the Lord Provost on the occasion of his receiving the Freedom of the City, he referred to the nine years of work and teaching in Glasgow as " the most productive and happiest years of my life " ; and yet many ask, if that were really true, why he made three attempts to leave, in the nine years he occupied the Glasgow Chair. When Mr Miller, the Professor of Surgery in the University of Edinburgh, died in 1864, he applied for the vacancy, but it was filled by the appointment of Mr James Spence ; again, when Mr Erichsen vacated the Chair of Surgery in University College, London, in 1866, in order to occupy the newly-formed Chair of Clinical Surgery, he once more applied, but Mr John Marshall was preferred.

It was not until 1869, when the state of Mr Syme's health caused him to resign the Chair of Clinical Surgery in Edinburgh University, that Lister succeeded in being elected to his distinguished father-in-law's chair. The reason no doubt lay in the terms of appointment of every surgeon of the Glasgow Infirmary at that date, namely, that he must give up his wards and cease to hold office, for at least a year, after ten years of service ; for Lister that was in 1870. It was a most fortunate occurrence both for him and for the world that, by the timely vacancy of a chair so distinguished and so desirable, he continued still to develop his new surgical doctrines and to teach under the best possible conditions, with large numbers of enthusiastic students and numerous visitors both from this country and from abroad.

The development of the so-called Aseptic system of surgery was no doubt, in its inception, a reaction from the too free use of chemical antiseptics to which I have already referred. It claims now at the hands of some of its cultivators to be a system of treatment, new and quite apart from that which Lister practised. It is the old story of the Stream asserting that it has become independent and has no further use for the Spring from which it took origin. There is no real antagonism in theory or in ultimate aim between them, and nothing divides them completely one from the other. A name is not sufficient to do this ; to prove that they are quite different, one must show a quite different system of treatment. The word ' Aseptic ' was introduced into English by Lister to indicate the condition of a wound from which Sepsis is absent. In the earlier days of

antiseptic treatment, surgeons spoke of a wound being in "an antiseptic condition," or of an operation as having been followed by a "thoroughly antiseptic result." It was to avoid such awkward expressions that Lister first introduced the word Aseptic. To speak of "the aseptic treatment of wounds" is as confused and as inelegant as to speak of the "antiseptic condition of wounds," since every method of avoiding sepsis is of course an antiseptic method. How far the changes of procedure in sterilising the dressings and instruments is a final and permanent progress remains to be seen. Certainly the skin of the part operated on and that of the hands of everyone concerned in an operation must be sterilised by the use of one or other form of chemical antiseptic. Whether the more complicated ritual, in the costume of Surgeon, assistant, and nurses, with gloves, masks, and head-dresses, is necessary for success also admits of doubt. Time will tell us. Meanwhile we may note that Lister was the first to use a dressing sterilised by heat. He introduced gauze into practice in the place of lint, and he also was the first to experiment with iodine as the steriliser of the skin. I assisted him in the early sixties in a case in which he used tincture of iodine for this purpose and also for a dressing of the wound. Wisely or unwisely he never tried it again. He practised from first to last in old-fashioned hospitals, each of which was well known to be far from salubrious, in the days of the old orthodox surgery, and his results were as good, so far as I am able to judge, as are anywhere obtained nowadays. The public who do not understand these matters necessarily conclude that

Lister's work has now been entirely superseded. This is well illustrated in a comparatively recently published Life of a Scottish Judge. He was in the habit of keeping a diary, and under a certain date states that he had that day a conversation on this subject with a celebrated surgeon.

"He mentioned how entirely the use of carbolic acid, which Lister used for spraying the wounds and sterilising the dressings, has been superseded by the process of sterilising hands, instruments, and dressings, except in the case of wounds which through delay have become poisoned. He mentioned the pathos of Lord Lister's last years, when he would not accept the position of a pioneer, but was bitterly disappointed because the whole surgical world had moved on from antisepticism to asepticism. He was so obsessed with this idea, poor man, that when a message of respect and admiration was sent to the old man by a group of very distinguished American Surgeons, he replied reproaching them for having given up the use of antiseptics."

I cannot believe the last sentence, and no one who knew Lister, I think, will readily do so. The reference, no doubt, applies to the date of his eightieth birthday, when he received congratulations and honours, from morning to night, from every part of the world. His biographer tells us that "a deputation waited on him in the morning headed by Jonathan Hutchinson, which, it was stipulated, should not stay more than a quarter of an hour, lest the effort should be too much for him. In this short time Hutchinson addressed him on behalf of the Royal College of Surgeons, in the unavoidable absence of the President, and recalled their close

acquaintance of over fifty years. Then Tilanus of Amsterdam and Madson of Copenhagen presented addresses on behalf of their respective countries and Lister made a brief reply."

This is the only mention of deputations expressing the wish to wait upon him, and he may have declined to meet others on the ground of his weakness, but not for the narrow-minded reason attributed to him in the passage I have quoted above.

I have often had conversations with Lister on aseptic surgery, and the objections I have heard him express were two-fold in character. First, he feared that this method of surgical practice, if fully cultivated, was quite incompatible with ordinary practice in private, and he saw that surgery must be converted into a pursuit which can be carried on successfully only in a splendidly equipped hospital. The surgeon will select only certain cases, or, what is the same thing, refuse admission to his wards of all that originate in septic germs, *e.g.* cases of acute osteomyelitis. It was always his dream that the antiseptic system should render possible the treatment in close proximity of various classes of case. Secondly, what was a still greater objection to aseptic treatment in his view was its unsuitability for the treatment of large abscesses which originate in tuberculous caries of the spine and other bones. There was no greater glory in the history of antiseptic surgery than the number of lives saved by Lister, and his faithful followers, in this class of case. So far as I can learn, they are now treated very much as they were seventy years ago, and with, I fear, a like result.

I may conclude these rather disjointed reminiscences by referring to some of the traits of character which Lister exhibited, for he was as remarkable in character as in achievement. From early training he was a man of true religious feeling and conviction, but seldom spoke of such matters except to very intimate friends. He was a man, too, of much courtesy, with gentle manners, modest, utterly unspoiled by fame and honours, always reverent and scrupulously truthful, and with marked appreciation of the work of others, especially if they were young men. With it all he was a man who could sometimes be aroused to great anger, especially by exhibitions of injustice, deceit, untruthfulness, or other disingenuous conduct. He could, and often did, show much intrepidity of action in circumstances of danger or urgency, and could quickly seize upon the right course to pursue, and follow it at once. I have already indicated this in speaking of the accident to his carriage, in which the coachman received fatal injuries. I can recall another occurrence which illustrates the same point. We were walking together one morning between the Surgical Hospital and the Medical Building of the Royal Infirmary, when loud screams were suddenly heard as we passed the Fever Hospital. On looking up we saw a man who had broken through one of the windows of a fever ward on the second floor, and was hanging out. He was kept from falling to the ground by the bravery of one woman, a nurse, who had a firm hold of one of his arms by both of hers. Lister rushed upstairs at once two steps at a time, and seizing a poker, smashed out the whole lower sash of the window, both glass and woodwork. He

then, by getting hold of the man, aided the nurse in supporting him for a minute or two longer, until some porters arrived from the Gate-house with ropes. By their united efforts they soon had the delirious patient back safely in the ward.

But perhaps the qualities which were of outstanding merit, in the work in which he was engaged during all his life, were his extraordinary powers of patience and perseverance. These seem to have been characteristic of him from his earliest days.

After I had given my *Oration* on Commemoration Day in the University in June 1914, the late Mr Alexander F. Morrison, a son of the Rector of the Glasgow Academy, and himself a solicitor practising in Glasgow, sent a letter to the *Glasgow Herald*, from which the following is an extract: "What perhaps most forcibly impresses one in Sir Hector Cameron's fine appreciation, is his reference to the great surgeon's divine discontent with things as they were in the surgical world, his patience and perseverance, and his extraordinary industry in the work he set himself to accomplish. And to those who know anything of his boyhood these are just the qualities he might be expected to possess. It may not be generally known that, in his early days, Lord Lister was a Quaker, and attended the Quaker School or College in Tottenham Court Road, London, of which the late Mr Binns was Principal. After graduating in the University of Aberdeen, my father, Dr Morrison, the late Rector of the Glasgow Academy, was appointed a classical master in the Quaker College, under Principal Binns, and amongst his pupils was Joseph Lister, who was

only a year or two younger than himself. He was a bright clever boy, and an insatiable student. Not content with the work prescribed for the day, he would read far ahead of his class-fellows ; and my father has often told me that he had frequently to rise of a morning before six o'clock, in order to keep abreast of his ardent pupil. Assuredly, in Lord Lister's case, the boy was father of the man. I trust Sir Hector Cameron will pardon me for adding this little tribute to his eloquent address."

In the public funeral service in Westminster Abbey on 16th February 1912, the Choir sang Handel's beautiful anthem, "which," as Lord Lister's biographer says, "though a strange blending of texts from the Old and New Testaments, was peculiarly applicable to the occasion."

"*When the ear heard him, then it blessed him, and when the eye saw him it gave witness of him ; he delivered the poor that cried, the fatherless and him that had none to help him. Kindness, meekness, and comfort were in his tongue. If there was any virtue and if there was any praise, he thought on those things. His body is buried in peace, but his name liveth evermore.*"

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